



PATENT  
ATTORNEY DOCKET NO.: INVIT 000-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Chesnut, et al. Art Unit: 1635  
Application No.: 09/935,280 Examiner: Unknown  
Filed: August 21, 2001  
Title: METHODS AND REAGENTS FOR MOLECULAR CLONING

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Commissioner for Patents  
Washington, D.C. 20231

INFORMATION DISCLOSURE STATEMENT

Sir:

In accordance with 37. C.F.R. § 1.97, enclosed are references relating to the above-identified application, including two U.S. patents that were cited in the enclosed International Search Report of the corresponding PCT application. For the convenience of the Examiner, these references are listed on the attached Form PTO-1449 and copies are enclosed herewith.

It is respectfully requested that these references be considered in the examination of this application and their consideration be made of written record in the application file.

CERTIFICATION UNDER 37 CFR §1.8	
I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date September 20, 2001, in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231.	
Aldon Griffis (Name of Person Mailing Paper)	
Aldon Griffis (Signature)	September 20, 2001 (Date)

In re Application of:  
Chesnut, et al.  
Application No.: 09/935,280  
Filed: August 21, 2001  
Page 2



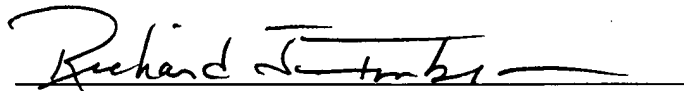
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No fee is deemed necessary in connection with the filing of this Information Disclosure Statement, because it is being filed prior to the receipt of a first office action on the merits of the above-captioned application. However, if any fee is required, authorization is hereby given to charge any fees associated with the filings submitted herewith, or credit any overpayment to Deposit Account No. 50-1355. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

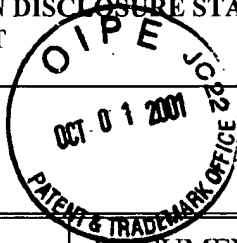
Date: September 20, 2001

  
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<b>FORM PTO-1449</b> U.S. Department of Commerce Patent and Trademark Office	<b>Docket No.:</b> INVIT1300-1	<b>Application No.:</b> 09/935,280
	<b>Applicants:</b> Chesnut et al.	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>	<b>Filing Date:</b> August 21, 2001	<b>Group Art Unit:</b> Unknown



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### U.S. PATENT DOCUMENTS

EXAM. INITIALS		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	AA	6,238,884 B1	05/29/01	Short	435	69.1	03/09/99
	AB	5,766,891	06/16/98	Shuman	435	91.41	12/19/94
	AC	4,800,159	01/24/89	Mullis	435	172.3	12/17/86

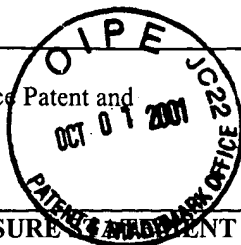
### FOREIGN PATENT DOCUMENTS

EXAM. INITIALS		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION (YES/NO)
	AD	00/56878	09/28/00	WO	C12N	15/10	No
	AE	98/56943	12/17/98	WO	C12P	19/34	No
	AF	98/55502	12/10/98	WO	C07K	5/00	No
	AG	98/20122	05/14/98	WO	C12N	15/10	No
	AH	97/24455	07/10/97	WO	C12Q		No
	AI	96/34981	11/07/96	WO	C12Q	1/68	No
	AJ	96/19497	06/27/96	WO	C07K	14/07	No
	AK	0 625 572 A1	09/22/93	EP	C12N	15/10	No
	AL	0 373 914 A2	12/13/89	EP	C12N	15/62	No

### OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages)

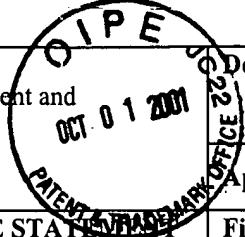
	AM	Carninci, et al. "High-Efficiency Full-Length cDNA Cloning by Biotinylated CAP Trapper," <i>Genomics</i> , 37(3):327-36 (1996) Academic Press, Inc.
	AN	Carninci, et al. "High Efficiency Selection of full-length cDNA by Improved Biotinylated Cap Trapper," <i>DNA Research</i> , 4:61-66 (1997). Universal Academy Press.
	AO	Cheng and Shuman, "DNA strand transfer catalyzed by vaccinia topoisomerase: ligation of DNAs containing a 3' mononucleotide overhang," <i>Nucleic Acids Res.</i> , 28(9):1893-8. (2000). Oxford University Press.

<b>FORM PTO-1449</b> U.S. Department of Commerce Patent and Trademark Office	<b>Docket No.:</b> INVIT1300-1	<b>Application No.:</b> 09/935,280
	<b>Applicants:</b> Chesnut et al.	
<b>INFORMATION DISCLOSURE BY APPLICANT</b>	<b>Filing Date:</b> August 21, 2001	<b>Group Art Unit:</b> Unknown



AP	Cheng and Shuman, "Recombinogenic flap ligation pathway for intrinsic repair of topoisomerase IB-induced double-strand breaks," <i>Mol. Cell. Biol.</i> 20(21):8059-8068 (2000) American Society for Microbiology.
AQ	Cheng and Shuman, "Site-specific DNA transesterification by vaccinia topoisomerase: Role of specific phosphates and nucleosides," <i>Biochemistry</i> 38(50):16599-612 (1999) American Chemical Society.
AR	Cheng and Shuman, "A catalytic domain of eukaryotic DNA topoisomerase I," <i>J. Biol. Chem.</i> 273(19):11589-95 (1998) The American Society for Biochemistry and Molecular Biology, Inc.
AS	Cheng, et al., "Conservation of structure and mechanism between eukaryotic topoisomerase I and site-specific recombinases," <i>Cell.</i> 92(6):841-50 (1998) Cell Press.
AT	Cheng, et al., "Mutational analysis of 39 residues of vaccinia DNA topoisomerase identifies Lys-220, Arg-223, and Asn-228 as important for covalent catalysis," <i>J. Biol. Chem.</i> 272(13):8263-9 (1997) The American society for Biochemistry and Molecular Biology, Inc.
AU	DiGate and Marians, "Molecular Cloning and DNA Sequence Analysis of <i>Escherichia coli topB</i> , the Gene Encoding Topoisomerase III," <i>J. Biol. Chem.</i> 264(30):17924-17930 (1989). The American society for Biochemistry and Molecular Biology, Inc.
AV	Edery, et al., "An Efficient Strategy to Isolate Full-Length cDNAs Based on an mRNA Cap Retention Procedure (CAPture)," <i>Mol. Cell. Biol.</i> , 15(6):3363-3371 (1995). American Society for Microbiology.
AW	Ericsson, et al., "Characterization of ts 16, a temperature-sensitive mutant of vaccinia virus," <i>J. Virol.</i> 69(11):7072-86 (1995) American Society for Microbiology.
AX	Gross and Shuman, "Vaccinia virions lacking the RNA helicase nucleoside triphosphate phosphohydrolase II are defective in early transcription," <i>J. Virol.</i> 70(12):8549-5 (1996) American Society for Microbiology.
AY	Haghighat and Sonenberg. "eIF4G Dramatically Enhances the Binding of eIF4E to the mRNA 5'-Cap Structure," <i>J. Biol. Chem.</i> , 272(35):21677-21680 (1997). The American society for Biochemistry and Molecular Biology, Inc.
AZ	Haghighat et al., "The eIF4G-eIF4E Complex is the Target for Direct Cleavage by the Rhinovirus 2A Proteinase," <i>J. Virol.</i> 70:8444-8450 (1996). American Society for Microbiology.
AAA	Henningfeld and Hecht, "A model for topoisomerase I-mediated insertions and deletions with duplex DNA substrates containing branches, nicks, and gaps," <i>Biochemistry</i> 34(18):6120-9. (1995) American Chemical Society.

<b>FORM PTO-1449</b> U.S. Department of Commerce Patent and Trademark Office	Docket No.: INVIT1300-1	Application No.: 09/935,280
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Filing Date: August 21, 2001	Filing Date: August 21, 2001	



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AAB	Invitrogen Corporation. <i>Invitrogen Catalog</i> , Carlsbad, California, pages 18, 29, 43, 44, 49-52 (1998).
AAC	Janknecht, et al., "Rapid and efficient purification of native histidine-tagged protein expressed by recombinant vaccinia virus," <i>Proc. Natl. Acad. Sci., U S A</i> 88:8972-8976(1991) National Academic of Sciences.
AAD	Kane and Shuman, "Vaccinia virus morphogenesis is blocked by a temperature-sensitive mutation in the I7 gene that encodes a virion component," <i>J. Virol.</i> 67(5):2689-98 (1993) American Society for Microbiology.
AAE	Kato, et al., "Construction of a Human Full-Length cDNA Bank," <i>Gene</i> . 150: 243-250 (1994) Elsevier Science.
AAF	Klemm, et al., "Peptide inhibitors of DNA cleavage by tyrosine recombinases and topoisomerases," <i>J. Mol. Biol.</i> 299(5):1203-16. (2000) Academic Press, Inc.
AAG	Klemperer, et al., "Identification and characterization of the orf virus type I topoisomerase," <i>Virology</i> 206:203-215 (1995) Academic Press, Inc.
AAH	Krogh and Shuman, "Vaccinia topoisomerase mutants illuminate conformational changes during closure of the protein clamp and assembly of a functional active site," <i>J. Biol. Chem.</i> July 5 2001 [Manuscript] The American Society for Biochemistry and Molecular Biology, Inc.
AAI	Krogh and Shuman, "Catalytic mechanism of DNA topoisomerase IB," <i>Mol. Cell.</i> 5(6):1035-41 (2000) Cell Press.
AAJ	Krogh and Shuman, "DNA strand transfer catalyzed by vaccinia topoisomerase: peroxidolysis and hydroxylaminolysis of the covalent protein-DNA intermediate," <i>Biochemistry</i> 39(21):6422-32. (2000) American Chemical Society.
AAK	Krogh, et al., "Effect of 2'-5' phosphodiesterases on DNA transesterification by vaccinia topoisomerase," <i>J. Biol. Chem.</i> 276(24):20907-20912. (2001) The American Society for Biochemistry and Molecular Biology, Inc.
AAL	Krogh, et al., "Melanoplus sanguinipes entomopoxvirus DNA topoisomerase: site-specific DNA transesterification and effects of 5'-bridging phosphorothiolates," <i>Virology</i> 264(2):441-51. (1999) Academic Press, Inc.
AAM	Maruyama and Sugano, "Oligo-Capping: A Simple Method to Replace the Cap Structure of Eukaryotic mRNAs with Oligoribonucleotides," <i>Gene</i> . 138:171-174 (1994).
AAN	Morham and Shuman, "Covalent and Noncovalent DNA Binding by Mutants of Vaccinia DNA Topoisomerase I," <i>J. Biol. Chem.</i> 267:15984-15992 (1992) The American Society for Biochemistry and Molecular Biology, Inc.

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AAO	Morham and Shuman, "Phenotypic selection and characterization of mutant alleles of a eukaryotic DNA topoisomerase I," <i>Genes. Dev.</i> 4(4):515-24 (1990) Cold Spring Harbor Laboratory Press.
AAP	Palaniyar, et al. "SFV topoisomerase: sequence specificity in a genetically mapped interval," <i>Virology</i> 221:351-354 (1996). American Press, Inc.
AAQ	Petersen and Shuman, "DNA strand transfer reactions catalyzed by vaccinia topoisomerase: hydrolysis and glycerololysis of the covalent protein-DNA intermediate," <i>Nucleic Acids Res.</i> 25(11):2091-7 (1997) Oxford University Press.
AAR	Petersen and Shuman, "Histidine 265 is important for covalent catalysis by vaccinia topoisomerase and is conserved in all eukaryotic type I enzymes," <i>J. Biol. Chem.</i> 272(7):3891-6 (1997) The American Society for Biochemistry and Molecular Biology, Inc.
AAS	Petersen et al., "Characterization of a DNA topoisomerase encoded by Amsacta moore entomopoxvirus," <i>Virology</i> 230(2):197-206 (1997) Academic Press, Inc.
AAT	Petersen, et al., "Mutations within a conserved region of vaccinia topoisomerase affect the DNA cleavage-religation equilibrium," <i>J. Mol. Biol.</i> 1263(2):181-95 (1996) Academic Press Limited.
AAU	Salazar et al., "The DNA strand in DNA.RNA hybrid duplexes is neither B-form nor A-form in solution," <i>Biochemistry</i> 32(16):4207-15 (1993) American Chemical Society.
AAV	Schmitt, et al., "Affinity purification of histidine-tagged proteins," <i>Molecular Biology Reports</i> 18:223-230 (1993).
AAW	Sekiguchi and Shuman, "Domain structure of vaccinia DNA ligase," <i>Nucleic Acids Res.</i> 25(4):727-34 (1997) Kluwer Academic Publishers.
AAX	Sekiguchi and Shuman, "Mutational analysis of vaccinia virus topoisomerase identifies residues involved in DNA binding," <i>Nucleic Acids Res.</i> 25(18):3649-56. (1997) Oxford University Press.
AAZ	Sekiguchi and Shuman, "Nick sensing by vaccinia virus DNA ligase requires a 5' phosphate at the nick and occupancy of the adenylate binding site on the enzyme," <i>J. Virol.</i> 71(12):9679-84 (1997) American Society for Microbiology.
BAA	Sekiguchi and Shuman, "Site-specific ribonuclease activity of eukaryotic DNA topoisomerase I," <i>Mol. Cell.</i> 1(1):89-97.(1997) Cell Press.
BAB	Sekiguchi and Shuman, "Covalent DNA binding by vaccinia topoisomerase results in unpairing of the thymine base 5' of the scissile bond," <i>J. Biol. Chem.</i> 271(32):19436-42 (1996). The American Society for Biochemistry and Molecular Biology, Inc.
BAC	Sekiguchi and Shuman, "Identification of contacts between topoisomerase I and its target DNA by site-specific photocrosslinking," <i>EMBO J.</i> 15(13):3448-57 (1996) Oxford University Press.
	Sekiguchi and Shuman, "Proteolytic footprinting of vaccinia topoisomerase bound to DNA," <i>J. Biol. Chem.</i> 270(19):11636-45 (1995) The American Society for Biochemistry and Molecular Biology, Inc.

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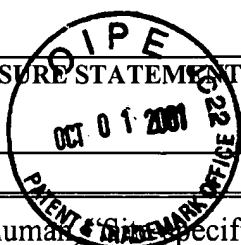
BAD	Sekiguchi and Shuman, "Requirements for noncovalent binding of vaccinia topoisomerase I to duplex DNA," <i>Nucleic Acids Res.</i> 22(24):5360-5 (1994) Oxford University Press.
BAE	Sekiguchi and Shuman, "Stimulation of vaccinia topoisomerase I by nucleoside triphosphates," <i>J. Biol. Chem.</i> 269(47):29760-4 (1994) The American Society for Biochemistry and Molecular Biology, Inc.
BAF	Sekiguchi and Shuman, "Vaccinia topoisomerase binds circumferentially to DNA," <i>J. Biol. Chem.</i> 269(50):31731-4 (1994) The American Society for Biochemistry and Molecular Biology, Inc.
BAG	Sekiguchi, et al., "Resolution of a Holliday junction by vaccinia topoisomerase requires a spacer DNA segment 3' of the CCCTT/ cleavage sites," <i>Nucleic Acids Res.</i> 28(14):2658-63. (2000) Oxford University Press.
BAH	Sekiguchi, et al., "Kinetic analysis of DNA and RNA strand transfer reactions catalyzed by vaccinia topoisomerase," <i>J. Biol. Chem.</i> 272(25):15721-8 (1997) The American Society for Biochemistry and Molecular Biology, Inc.
BAI	Sekiguchi, et al., "Mechanism of inhibition of vaccinia DNA topoisomerase by novobiocin and coumermycin," <i>J. Biol. Chem.</i> 271(4):2313-22 (1996) The American Society for Biochemistry and Molecular Biology, Inc.
BAJ	Sekiguchi, et al., "Resolution of Holliday junctions by eukaryotic DNA topoisomerase I," <i>Proc. Natl. Acad. Sci. U S A.</i> 93(2):785-9. (1996) National Academic of Sciences.
BAK	Shuman, "Analysis of topoisomerase-DNA interactions by electrophoretic mobility shift assay," <i>Methods Mol. Biol.</i> 95:65-74(2001) Humana Press, Inc.
BAL	Shuman, "Polynucleotide ligase activity of eukaryotic topoisomerase I," <i>Mol. Cell.</i> 1(5):741-8. (1998) Cell Press.
BAM	Shuman, "Vaccinia virus DNA topoisomerase: a model eukaryotic type IB enzyme," <i>Biochim. Biophys. Acta.</i> 1400(1-3):321-37. (1998) Elsevier Science.
BAN	Shuman, "Vaccinia virus DNA ligase: specificity, fidelity, and inhibition," <i>Biochemistry</i> 34:16138-16147 (1995) American Chemical Society.
BAO	Shuman, "Novel approach to molecular cloning and polynucleotide synthesis using vaccinia DNA topoisomerase" <i>J. Biol. Chem.</i> 269(51):32678-32684 (1994).
BAP	Shuman, "DNA Strand Transfer Reactions Catalyzed by Vaccinia Topoisomerase I", <i>J. Biol. Chem.</i> 267:8620-8627. (1992) The American Society for Biochemistry and Molecular Biology, Inc.
BAQ	Shuman, "Two Classes of DNA End-Joining Reactions Catalyzed by Vaccinia Topoisomerase I", <i>J. Biol. Chem.</i> 267:16755-16758. (1992) The American Society for Biochemistry and Molecular Biology, Inc.
BAR	Shuman, "Recombination mediated by vaccinia virus DNA topoisomerase I in Escherichia coli is sequence specific," <i>Proc. Natl. Acad. Sci. U S A.</i> 88(22):10104-8 (1991) National Academic of Sciences.

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BAS	Shuman, "Site-specific DNA cleavage by vaccinia virus DNA topoisomerase I. Role of nucleotide sequence and DNA secondary structure," <i>J. Biol. Chem.</i> 266(3):1796-1803 (1991) The American Society for Biochemistry and Molecular Biology, Inc.
BAT	Shuman, "Site-specific interaction of vaccinia virus topoisomerase I with duplex DNA. Minimal DNA substrate for strand cleavage in vitro," <i>J. Biol. Chem.</i> 266(17):11372-11379 (1991) The American Society for Biochemistry and Molecular Biology, Inc.
BAU	Shuman, "Vaccinia DNA topoisomerase I promotes illegitimate recombination in <i>Escherichia coli</i> ," <i>Proc. Natl. Acad. Sci. U S A.</i> 86(10):3489-93 (1989) National Academic of Sciences.
BAV	Shuman and Moss, "Identification of a Vaccinia Virus Gene Encoding a Type I DNA Topoisomerase," <i>Proc. Natl. Acad. Sci., U S A</i> 84:7478-7482. (1987) National Academic of Sciences.
BAW	Shuman and Prescott. "Specific DNA Cleavage and Binding of Vaccinia Virus DNA Topoisomerase I" <i>J. Biol. Chem.</i> 265:17826-17836. (1990) The American Society for Biochemistry and Molecular Biology, Inc.
BAX	Shuman and Turner, "Site-specific interaction of vaccinia virus topoisomerase I with base and sugar moieties in duplex DNA," <i>J. Biol. Chem.</i> 268(25):18943-50 (1993) The American Society for Biochemistry and Molecular Biology, Inc.
BAY	Shuman, et al., "Intramolecular synopsis of duplex DNA by vaccinia topoisomerase," <i>EMBO J.</i> 16(21):6584-9 (1997) Oxford University Press.
BAZ	Shuman, et al., "Insertional mutagenesis of the vaccinia virus gene encoding a type I DNA topoisomerase: evidence that the gene is essential for virus growth," <i>Virology.</i> 170(1):302-6 (1989) Academic Press, Inc.
CAA	Shuman, et al., "Mapping the active-site tyrosine of vaccinia virus DNA topoisomerase I," <i>Proc. Natl. Acad. Sci. U S A.</i> 86(24):9793-7 (1989) National Academic of Sciences.
CAB	Shuman, et al., "Characterization of Vaccinia Virus DNA Topoisomerase I Expressed in <i>Escherichia coli</i> ," <i>J. Biol. Chem.</i> 263:16401-16407. (1988) The American Society for Biochemistry and Molecular Biology, Inc.
CAC	Stivers, et al., "Stereochemical outcome and kinetic effects of Rp- and Sp-phosphorothioate substitutions at the cleavage site of vaccinia type I DNA topoisomerase," <i>Biochemistry</i> 39(18):5561-72. (2000) American Chemical Society.
CAD	Stivers et al., "Vaccinia DNA topoisomerase I: kinetic evidence for general acid-base catalysis and a conformational step," <i>Biochemistry</i> 33(51):15449-58 (1994) American Chemical Society.



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CAE	Stivers, et al., "Vaccinia DNA topoisomerase I: single-turnover and steady-state kinetic analysis of the DNA strand cleavage and ligation reactions," <i>Biochemistry</i> 33(1):327-39 (1994) American Chemical Society.
CAF	Wang and Shuman, "Deletions at the carboxyl terminus of vaccinia DNA topoisomerase affect DNA binding and enhance distributivity in DNA relaxation," <i>Biochemistry</i> 36(13):3909-16 (1997) American Chemical Society.
CAG	Wang, et al., "Mutational analysis of 26 residues of vaccinia DNA topoisomerase identifies Ser-204 as important for DNA binding and cleavage," <i>Biochemistry</i> 36(26):7944-50 (1997) American Chemical Society.
CAH	Wittschieben and Shuman, "Mechanism of DNA transesterification by vaccinia topoisomerase: catalytic contributions of essential residues Arg-130, Gly-132, Tyr-136 and Lys-167," <i>Nucleic Acids Res.</i> 25(15):3001-8. (1997) Oxford University Press.
CAI	Wittschieben and Shuman, "Mutational analysis of vaccinia DNA topoisomerase defines amino acid residues essential for covalent catalysis," <i>J. Biol. Chem.</i> 269(47):29978-83 (1994) The American Society for Biochemistry and Molecular Biology, Inc.
CAJ	Wittschieben, et al., "Replacement of the active site tyrosine of vaccinia DNA topoisomerase by glutamate, cysteine or histidine converts the enzyme into a site-specific endonuclease," <i>Nucleic Acids Res.</i> 26(2):490-6. (1998) Oxford University Press.
CAK	Woodfield, et al., "Vaccinia topoisomerase and Cre recombinase catalyze direct ligation of activated DNA substrates containing a 3'-para-nitrophenyl phosphate ester," <i>Nucleic Acids Res.</i> 28(17):3323-31 (2000) Oxford University Press.
CAL	Yang, et al., "A eukaryotic enzyme that can disjoin dead-end covalent complexes between DNA and type I topoisomerases," <i>Proc. Natl. Acad. Sci. U S A.</i> 93(21):11534-9 (1996) National Academic of Sciences.

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Application No.: 09/935,280 Examiner: Unknown  
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Title: METHODS AND REAGENTS FOR MOLECULAR CLONING

Commissioner for Patents  
Washington, D.C. 20231

TRANSMITTAL SHEET

Transmitted herewith for the above-identified application please find:

1. Information Disclosure Statement (2 pages);
2. Form PTO-1449 (7 pages);
3. Three (3) U.S. Patents;
4. Nine (9) Foreign Patents;
5. Seventy-Eight (78) Other Documents;
6. International Search Report (6 pages); and
7. Return Receipt Postcard.

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CERTIFICATION UNDER 37 CFR §1.8	
I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date, September 20, 2001, in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231.	
Aldon Griffis (Name of Person Mailing Paper)	
<i>Aldon Griffis</i> (Signature)	September 20, 2001 (Date)

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The Fee for this Response is calculated as follows:

For	Claims Remaining After Amendment	Highest Number Previously Paid For	Extra Claims	Large Entity Rate	Small Entity Rate	Calculations
Total Claims	-	-	-	x \$18	x \$09	\$0
Independent Claims	-	-	-	x \$80	x \$40	\$0
Multiple Claims	-	-		\$270	\$135	\$0
Basic Filing Fee	-	-		\$710	\$355	\$0
					TOTAL FEE	\$0

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